Transactions of the Royal Society of S. Aust. (1992), **116**(4), 141-143.

BRIEF COMMUNICATION

NEW RECORDS OF *MESAPHORURA* (COLLEMBOLA: ONYCHIURIDAE, TULLBERGIINAE) SPECIES FROM AUSTRALIA, MACQUARIE ISLAND AND THE ANTARCTIC

The Tullbergiinae is a subfamily of strongly reduced Collembola lacking ocelli, pigment and furca, which is adapted for soil living. Within this subfamily the genus *Mesaphorura* currently comprises over 20 described species most of which are only known from the Northern Hemisphere. Specimens belonging to the genus *Mesaphorura* are commonly found in Australia in moist soil under arable and grazing regimes, and also, more rarely, in soils under native vegetation. *Mesaphorura krausbaueri* Börner 1901[1] was recorded from Australia[2-5] and specimens determined as *Mesaphorura* sp. *krausbaueri* group were recorded from southern Australia and Macquarie Island[6]. Three species of *Mesaphorura* already known from Europe have been identified from Australia, and they have all probably been introduced relatively recently with Europeans. All material discussed is deposited in the South Australian Museum collection.

Mesaphorura Börner, 1901

Diagnosis: elongate poduromorph Collembola about 500-600 μm long, lacking ocelli, pigment and furca, and possessing pseudocelli on head, thoracic and abdominal segments with the formula 11/011/00010 or 11/011/10011; antennal III organ normally with two curved cylindrical clubs and two small pegs, only a small cuticular swelling in front of pegs without enlarged granules; ant IV without greatly enlarged sensilla; postantennal organ elongate, consisting of two parallel rows each of 10 to 20 simple elongate vesicles arranged at right angles to longitudinal axis of the organ; abd VI with a pair of crescentic cuticular ridges anteriorly and two posterior anal spines shorter than claw.

[4]Abbreviations: collectors, KK, K. King, PG, P. Greenslade, HW, H. Womersley.

Key to Australian species (after [7,8,9,10])

1. 3 + 3 median microchaetae in anterior row between a_3 on abd V (a_2 present); a_1 either a micro- or a macrochaeta on abd IV; L_2 present on anal lobes; a_4 of abd V not displaced anteriorly; pseudocelli on thorax close to mid line, behind or between p_3 and p_4 2
   2 + 2 median microchaetae in anterior row between a_3 on abd V (a_2 absent); a_1 a microchaeta on abd IV; L_2 missing on anal lobes; a_4 of abd V displaced anteriorly; pseudocelli of thorax between m_5 and p_5 ... *M. critica*
2. M_5 present on abd IV; long macrochaeta (i.e. a_2 on abd IV) over twice the length of microchaeta (a_1); macrochaeta a_4 on abd V is shorter than macrochaeta p_2; p_1 a macro- and p_2 a microchaeta on abd IV ..... *M. macrochaeta*
   M_5 absent on abd IV; macrochaeta (i.e. a_2 on abd IV) only 1.8 times as long than microchaeta (a_1); macrochaeta a_4 on abd V longer than p_2; p_2 a macrochaeta and p_1 a microchaeta on abd IV ..... *M. yosii*

Mesaphorura macrochaeta Rusek.

Mesaphorura macrochaeta Rusek 1976 p. 33.
FIG. 1

Material examined: **Australian Antarctic Territory,** Mawson Station, pot plant soil (*Coleus, Philodendron?*), January 1989, PG, *ca.* 200 exs; **Macquarie Island,** Isthmus, in greenhouse, soil and moss, 2.xii.86, PG; **New South Wales,** Armidale, Chiswick native pasture, plot 8, 21.viii.78, 26.ii.73, KK, 2 ex; Chiswick improved pasture, ungrazed, 26.ii.72, KK, 2 exs; Cambewarra Ranges, 10 k W of Narooma, leaf litter, Sept 1990, PG, 1 ex; **South Australia,** Mt Lofty Ranges, Bridgewater, Engelbrook Reserve, leaf litter, 16.v.71, PG, 2 exs; Belair, in moss, April 1938, HW, 1 ex; Belair, grass mowings, 27.v.1971, PG, 2 exs; Coorong, Coolatoo, pitfall traps in grass beside road, 28.ix-8.x.75, PG, 1 ex 15 k N Mt Gambier, *Pinus radiata* leaf litter, 19.v.1975, PG, 2 exs.

Distribution: described from Canada but common in North America and Europe. *Mesaphorura macrochaeta* is abundant in improved pasture in southeastern Australia and has been introduced to an Australian Antarctic Territory Station and to Macquarie Island in imported soil, probably from Tasmania.

Mesaphorura critica Ellis.

Mesaphorura critica Ellis 1976 p. 230.
FIG. 2

Material examined: **South Australia,** Koonamore Station, 340 km NNE Adelaide, Black Oak Creek, leaf litter, 25.vii.1971, PG, 1 ex.

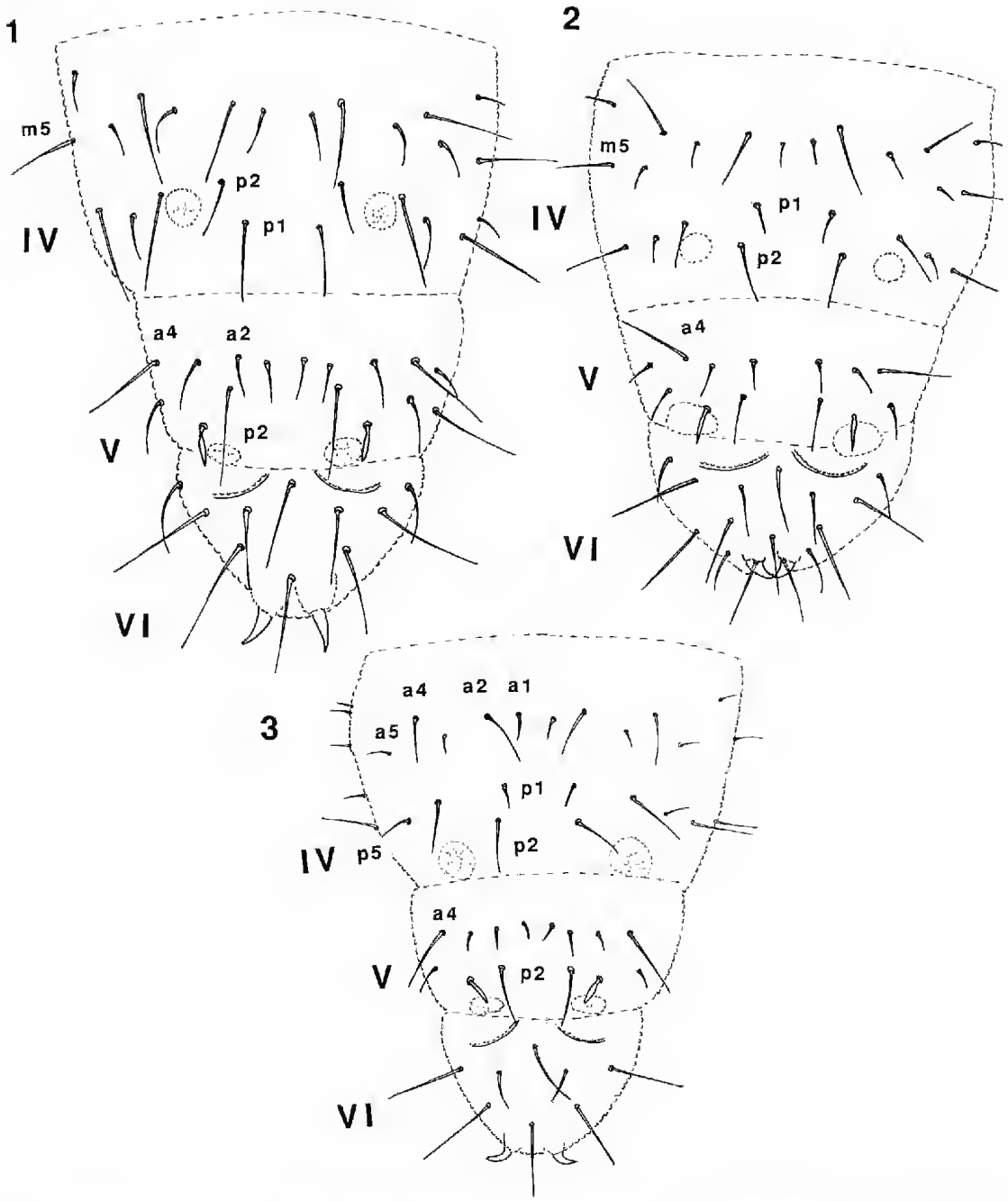
Distribution: previously only known from Europe[11].

Mesaphorura yosii (Rusek)

Tullbergia yosii Rusek 1967 p. 191.
FIG. 3

Material examined: **New South Wales,** Armidale, Chiswick native pasture plots, plot 8, 21.viii.78, KK, 2 exs; Chiswick improved pasture, ungrazed plots, 26.ii.72, KK, 1 ex; **Queensland,** 17 km east of Killarney, wet sclerophyll forest, leaf litter, 16.v.76, PG, 1 ex; Great Barrier Reef, Swain's Reef, Frigate Cay, 22.vii.1983, KK, 1 ex; **South Australia,** Koonamore, 340 km NNE Adelaide, Black Oak Creek, leaf litter, 25.vii.73, PG, 2 exs; 10 km N Whyalla, Middleback Stn, under *Casuarina stricta*, 8.x.79, PG, 1 ex.

Distribution: Europe, North America, China[12], Australia, New Caledonia[13].



Figs 1-3. 1, *Mesaphorura macrochaetae* Rusek. Dorsal chaetotaxy of abdomen IV-VI. 2. *M. critica* Ellis. Dorsal chaetotaxy of abdomen IV-VI. 3, *M. yosii* Rusek. Dorsal chaetotaxy of abdomen IV-VI.

Both *M. yosiii* and *M. macrochaeta* are found together in improved pastures in southeastern Australia, generally *M. yosiii* is found on warmer sites and M. macrochaetae in cooler, more southerly regions. Is likely that both were introduced to Australia with Europeans. Morphological differences between the species are given by Rusek[8] and are cited in the key. The specimen from Darlington, Western Australia, determined by Womersley[2] as *M. krausbaueri*, is not in good enough condition to be identified, but other specimens from Belair, South Australia, also determined by Womersley as *M. krausbaueri*, are in fact *M. macrochaeta*. It seems probable that *M. krausbaueri* does not occur in Australia.

All three species are likely to be more widely distributed than these scattered records suggest. In Canadian forests *M. yosiii* and *M. microchaeta* can occur together but have slightly different vertical distributions with *M. macrochaeta* markedly aggregated in the humus layer and upper soil horizon from 0 to 5 cms in depth, and *M. yosiii* concentrated lower in the soil profile and more randomly spaced[14]. In another Canadian forest where *M. macrochaeta* was absent, *M. yosiii* occupied the whole soil profile. This suggests possible competitive exclusion of *M. yosiii* by *M. macrochaeta* on some sites. *Mesaphorura critica* may have been included with the species *M. yosiii* in these ecological studies. In Australia, *M. critica* has been found only under arid native vegetation.

[1]**Börner, C.** (1901) Zool. Anz. 24, 1-15.
[2]**Womersley, H.** (1935) Trans. R. Soc. S.Austr. 59, 207-218.
[3]**Womersley, H.** (1939) "Primitive insects of South Australia". (Government Printer, Adelaide).
[4]**King, K. Greenslade, P. & Hutchinson, K.** (1986) Aust. J.Ecol. 10, 421-427.
[5]**Greenslade, P. & Ireson, J. E.** (1986) J. Aust. ent. Soc. 25, 273-291.
[6]**Greenslade, P.** (1990) Pap. Proc. R. Soc. Tas. 124(1), 35-50.
[7]**Rusek, J.** (1971) Acta ent. bohemoslov. 68, 188-206.
[8]**Rusek, J.** (1976) Canad. J. Zool. 54 (1), 19-41.
[9]**Rusek, J.** (1986) pp 73-78. *In* Dallai, R. (Ed.) "2nd International Seminar on Apterygota." (University of Siena, Italy).
[10]**Fjellberg, A.** (1973) "Identification keys to Norwegian Collembola". pp 1-152. (Norwegian Entomological Society, As-NLH, Norway).
[11]**Ellis, W. N.** (1976) Tijdschr, Ent. 119(8), 221-326.
[12]**Rusek, J.** (1967) Acta ent. bohemoslov. 64, 184-194.
[13]**Weiner, W. & Najt, J.** (1991) Mem. Mus.natn. Hist. nat. (A), 149, 119-130.
[14]**Rusek, J.** (1979) Acta ent. bohemoslov. 76, 1-9.

P. GREENSLADE, c/o CSIRO, Division of Entomology, GPO Box 1700, Canberra, A.C.T. 2601, Australia.